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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,133	03/29/2004	Long-Sun Huang	DEE-PT161	2167

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VOLPE AND KOENIG, P.C.  
UNITED PLAZA, SUITE 1600  
30 SOUTH 17TH STREET  
PHILADELPHIA, PA 19103

EXAMINER
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MCPHERSON, JOHN A

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/812,133	<b>Applicant(s)</b> HUANG ET AL.	
	<b>Examiner</b> John A. McPherson	<b>Art Unit</b> 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1 is objected to because of the following informalities: in line 4, "siad" should be corrected to --said--. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. Claims 1-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 18 each present a method comprising defining a plurality of grating zones and forming layers on said grating zones (see claim 1, lines 12-14 and claim 18, lines 8-10), however in the last step of each claim refers to "said grating zone" (i.e. singular, not plural as in the proceeding steps of the claims). It is not clear if the last step is to be performed only for a single grating zone (as implied by the use of "zone"), or if it is intended to be performed for the previously introduced plurality of grating zones (as implied by the use of "said").

Claims 2-17 and 19-23 are included in this rejection only because they each depend from an indefinite claim.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's discussion of the prior art in the specification in view of either one of US 6,238,581 to Hawkins et al. (US '581) or US 2004/0027225 to Lee et al. (US '225). Applicant's discussion of the prior art in the specification substantially teaches the invention as claimed, with the exception that the prior art utilizes aluminum or copper as the material of the sacrifice layer (i.e. corresponding to the layer formed in step c of claim 1 and step b of claim 18, and removed in step j of claim 1 and step g of step 18). See paragraphs [0004] to [0009]. Applicant's discussion of the prior art does not teach utilizing silicon oxide as the material of the sacrifice layer.

US '581 discloses a process for manufacturing an electro-mechanical grating device comprising the steps of depositing and then removing a sacrificial layer, wherein the material of the sacrificial layer is selected from a group including silicon oxide. See the abstract and column 6, lines 42-52. US '225 discloses a method of manufacturing a micro electromechanical differential actuator useful in a system such as a grating modulator, wherein the method comprises depositing a sacrifice layer and later performing structure releasing, wherein the material of the sacrifice layer is silicon oxide. See the abstract and paragraph [0031]. It would have been obvious to one skilled in the requisite art to utilize silicon oxide, as taught by either US '581 or US '225, as the sacrifice layer in Applicant's disclosed prior art process because it is taught that silicon oxide is known in the art as a useful material for a sacrifice layer in a process of

manufacturing an electromechanical grating device, allowing for the formation and release of an electrically actuated grating device.

4. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's discussion of the prior art in the specification in view of either one of US 2004/0224523 to Bae et al. (US '523) or JP 6-343272 (JP '272). Applicant's discussion of the prior art in the specification substantially teaches the invention as claimed, with the exception that the prior art utilizes aluminum or copper as the material of the sacrifice layer (i.e. corresponding to the layer formed in step c of claim 1 and step b of claim 18, and removed in step j of claim 1 and step g of step 18). See paragraphs [0004] to [0009]. Applicant's discussion of the prior art does not teach utilizing silicon oxide as the material of the sacrifice layer.


US '523 discloses a method of fabricating micro-electromechanical systems utilizing a sacrificial layer, wherein the material of the sacrificial layer is selected from a group including silicon oxide and copper. See the abstract and paragraph [0017]. JP '272 discloses a method for the manufacture of a micromachine comprising uniformly forming a sacrificial layer, wherein the material of the sacrificial layer is selected from silicon oxide or aluminum. See the abstracts. It would have been obvious to one skilled in the requisite art to utilize silicon oxide, as taught by either US '523 or JP '272, as the sacrifice layer in Applicant's disclosed prior art process because it is taught that silicon oxide is an art-recognized alternative to either copper or aluminum as the material of a sacrifice layer in a process of fabricating a micro-electromechanical system.

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5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John A. McPherson whose telephone number is (571) 272-1386. The examiner can normally be reached on Monday through Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John A. McPherson  
Primary Examiner  
Art Unit 1756

JAM  
2/26/05